Before the
**FEDERAL COMMUNICATIONS COMMISSION**
Washington, DC 20554

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| In the Matter of | ) | |
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| Amendments to Part 4 of the Commission's Rules Concerning Disruptions to Communications | ) | PS Docket No. 15-80 |
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| | ) | ET Docket No. 04-35 |
| New Part 4 of the Commission's Rules Concerning Disruptions to Communications | ) | |
| | ) | |
| | ) | PS Docket No. 11-82 |
| The Proposed Extension of Part 4 of the Commission's Rules Regarding Outage Reporting to Interconnected Voice Over Internet Protocol Service Providers and Broadband Internet Service Providers | ) | |

To: The Commission

**COMMENTS OF**
**HUGHES NETWORK SYSTEMS, LLC**

Hughes Network Systems, LLC ("Hughes") submits these comments in response to the further notice of proposed rulemaking to amend the Commission's Part 4 rules to adopt outage reporting requirements for broadband Internet access services ("BIAS") and update the interconnected Voice-over-IP ("VoIP") outage reporting requirements to be more consistent with the requirements for other services.[1]

[1] *See Amendments to Part 4 of the Commission's Rules Concerning Disruptions to Communications*, Report and Order, Further Notice of Proposed Rulemaking, and Order on Reconsideration, 31 FCC Rcd 5817 (2016) ("*FNPRM*").

## I. INTRODUCTION

As the nation's leading satellite provider of consumer broadband services, Hughes shares the Commission's goal to "ensure reliability of broadband networks used to deploy critical communications services, used both for emergency and non-emergency purposes."[2] With more than one million customers in North America, Hughes critically relies upon its expanding satellite broadband network, which includes SPACEWAY 3, the world's first commercial satellite with onboard switching and routing,[3] and JUPITER 1 (a/k/a EchoStar XVII), a high-throughput satellite offering capacity in excess of 100 Gbps.[4] With the upcoming scheduled December 2016 launch of JUPITER 2 (a/k/a EchoStar XIX), another high-throughput satellite, Hughes will further expand its satellite capacity for consumer broadband services to North America.[5] JUPITER 2 will provide advanced satellite broadband coverage across the United States and increase network broadband speeds to 25 Mbps and beyond. Hughes also is developing a new JUPITER 3 satellite and expects to launch it by decade's end.

Hughes understands that outage reporting can offer a valuable tool for the Commission and consumers. Hughes, however, urges that the Commission consider BIAS and VoIP outage reporting requirements that are suitably tailored to satellite capabilities and network visibility.

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[2] *FNPRM* ¶ 93.

[3] *See* PR Newswire, *Hughes' Next-Generation SPACEWAY 3 Satellite Successfully Launched*, (Aug. 15, 2007), http://www.prnewswire.com/news-releases/hughes-next-generation-spaceway-3-satellite-successfully-launched-58224077.html.

[4] *See* Hughes, *EchoStar XVII: One of the World's Most Advanced High-throughput Satellites*, http://www.hughes.com/technologies/satellites/echostar-xvii (last visited Aug. 26, 2016).

[5] *See* Caleb Henry, *EchoStar Excited About 2016 Launches, Musing Jupiter 3 Next Gen HTS*, Satellite Today (Feb. 25, 2016), http://www.satellitetoday.com/launch/2016/02/25/echostar-excited-about-2016-launches-musing-jupiter-3-next-gen-hts/.

## II. OUTAGE REPORTING REQUIREMENTS SHOULD ACCOUNT FOR SATELLITE CAPABILITIES AND NETWORK VISIBILITY

As a general principle, BIAS and VoIP outage reporting requirements should reflect the technical realities and limits of the broadband networks used to provide those services. Broadband providers, such as Hughes, expend significant resources to maintain situational awareness of their networks and the services provided to customers. Broadband providers, however, cannot adequately report for outages beyond the network facilities that they control.[6] Thus, for example, it is not feasible for satellite broadband providers to test or monitor other satellite or terrestrial networks that may be reached by their customers. Additionally, requiring providers to report on the source of outages originating on other networks would entail speculation as to the source or scope of the outage and yield multiple, potentially conflicting reports that could hinder any FCC investigation.

Further, although BIAS providers may be able to monitor and report on certain network segments or connectivity identified as critical for National Security/Emergency Preparedness, public safety, or emergency preparedness,[7] such monitoring can be resource intensive and consume network capacity that could be more efficiently used for consumer services. Thus, the Commission should limit the number and type of network segments or connectivity identified as critical, and should not identify all consumer BIAS networks segments or connectivity as critical infrastructure for public safety or emergency preparedness purposes.

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[6] *See FNPRM* ¶ 112 (seeking comment on "whether BIAS providers could be used as a central reporting point for all broadband network outages, i.e., whether our part 4 assurance goals for broadband outage reporting can be effectuated through, or should be limited to, an approach in which only BIAS providers (as opposed to other entities providing networks or services) would be required to report").

[7] *See id.* ¶ 113.

## III. WITH MINOR MODIFICATION OR CLARIFICATION, THE PROPOSED THROUGHPUT-BASED METRICS FOR BIAS OUTAGE REPORTING OFFERS A REASONABLE APPROACH

As the *FNPRM* indicates, the proposed throughput-based metric approach offers certain advantages and is more suitable than a user-based metric approach, which would require an accounting of the number of potentially affected users.[8] Throughput is more reflective of an outage event, whereas a user-based metric would be unworkable and unduly burdensome. Under a user-based metric approach, the same outage may be reportable if the affected network facilities support a large number of customers, but unreportable if those same facilities support fewer customers. This dichotomy seems arbitrary and unwarranted.

In any event, to the extent a user-based metric is contemplated, the Commission should not revisit or adopt its 2011 proposal to use potentially affected IP addresses as a proxy for the number of potentially affected users.[9] As previous commenters have observed, the number of affected IP addresses is not a useful proxy for affected users.[10] Each provider allocates a different number of IP addresses per subscriber, and subscribers may use techniques such as Network-Address-Translation to place multiple devices behind one or more addresses. In addition, the deployment of IPv6 further complicates the matter because of the massive difference in scale in the allocated subnets.[11] As an example, for customers on Hughes' current satellite platform, each individual subscriber has an IPv6 subnet with several quintillion addresses and an IPv4 subnet with five addresses. Therefore, the number of affected IP

[8] *See id.* ¶¶ 130-131.

[9] *See id.* ¶¶ 131-32 (revisiting the Commission's 2011 proposal to use potentially-affected IP addresses as a proxy for number of potentially affected users).

[10] *See id.* ¶ 129 (citing Verizon's comments on the *2011 Part 4 NPRM*).

[11] *See id.* ¶ 132 (seeking comment on how the transition to IPv6 would affect an IP address-based metric).

addresses is not well correlated with the number of users, the number of lines of service, or the scale of the service impact.

### A. "Hard Down" Outages

Based on a throughput metrics approach, the proposed reporting requirement for a "hard down" outage lasting at least 30 minutes in duration *and* potentially affecting at least 22,500 Gbps user minutes may be acceptable with minor modification or clarification.[12] For example, the rules should expressly provide that "Gbps user minutes" will be calculated by multiplying the affected throughput (measured in Gbps) by the outage duration (measured in minutes).[13] Additionally, the Commission should consider a threshold higher than the proposed 22,500 Gbps user minutes (*e.g.,* 45,000 Gbps user minutes) to minimize regulatory burdens while ensuring reporting of significant outages.

### B. Performance Degradation Outages

For outages or disruptions that significantly degrade communications, the proposal to use a "generally useful availability and connectivity" metric may be sufficient to capture occurrences during which customers are unable to use their broadband service.[14] Specifically, the proposed throughput-based metric set at "1 Gbps for a network outage or service disruption event lasting

[12] *See id.* ¶ 130; Appendix C, Proposed 4.9(i) (proposing that all BIAS providers notify the Commission of an outage of at least 30 minutes duration that potentially affects (i) at least 22,500 Gbps user minutes, (ii) potentially affects any special offices and facilities, or (iii) potentially affects certain special a 911 special facility).

[13] *See id.* ¶ 130 (describing calculation method as "multiply the size of the facility measured in Gbps, by the duration of the event measured in minutes, and this total generates a Gbps user minute number").

[14] *Id.* ¶ 134.

30 minutes or more" is acceptable, provided that the metric is based upon network-level, not user-level, performance.[15]

Importantly, the metric should focus on the path from a customer's premises to the first Internet hand-off point where the customer's traffic leaves the sole control of the BIAS provider. Downstream connectivity issues, such as an inability to reach a specific provider, are difficult to detect, and BIAS providers often will not be able to provide useful information on the scope, duration, or cause of such performance degradation. Additional metrics measuring packet loss and latency would focus unduly on service end points, increase the complexity of measurement, consume limited network resources, and offer minimal (if any) additional useful information.

Consequently, the proposed metric based on throughput (between the customer's premises and where customer traffic egresses the BIAS network) is straightforward and reflects the ability of customers to use their service. Further, to avoid duplicative reporting and minimize regulatory burdens, the Commission should clarify that "hard down" outages and performance degradation outages are mutually exclusive for reporting purpose. Thus, a BIAS provider reporting a "hard down" outage should not be required to determine or report that the same outage also may qualify as a performance degradation.

## IV. THE COMMISSION SHOULD UPDATE THE INTERCONNECTED VOIP OUTAGE REPORTING RULES

The Commission should update the interconnected VoIP outage reporting rules to incorporate the same three-step process applied to other services.[16] The metrics for determining reportable outages, however, should reflect the unique capabilities of satellite VoIP services. Specifically, for satellite VoIP services, a throughput-based metric alone may not be reasonably

[15] *Id.* ¶ 138.

[16] *See* i*d.* ¶¶ 163, 166, 169.

measured or useful to determine a reportable performance degradation outage. Additional measurements of packet loss and latency are likely sufficient to infer throughput-related problems and verify connectivity issues. Based on Hughes' VoIP experience, latency in excess of 1400 ms and/or packet loss in excess of 2.5 percent are indicative of VoIP connectivity issues and thus should be included as additional metrics for determining reportable performance degradation outages.

## V. CONCLUSION

Based upon the foregoing, Hughes supports the Commission's efforts to improve and update its Part 4 outage reporting rules. With a few modifications discussed above, the Commission's proposed BIAS and VoIP outage requirements offer a reasonable path forward.

Respectfully submitted,

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